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(54) COATED GLASS CLOTH

## (57)Abstract:

PROBLEM TO BE SOLVED: To provide inexpensive coated glass cloth excellent in flameproofness and fire retardancy and friendly to a human body and the environment.

SOLUTION: The coated glass cloth is obtained by laminating a resin composition containing a polyolefinic resin and a flameproof and fire-retardant compound on glass cloth.

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CLAIMS

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[Claim(s)]

[Claim 1] The coated glass textile which carried out the laminating of the resin constituent containing polyolefine system resin and a flame-proofing fire retardancy compound to the glass textile.

[Claim 2] The coated glass textile according to claim 1 whose glass textiles are plain weave glass fabrics.

[Claim 3] The coated glass textile according to claim 1 or 2 whose flame-proofing fire retardancy compound is a metal hydroxide.

[Claim 4] The coated glass textile according to claim 3 whose metal hydroxide is a magnesium hydroxide or an aluminum hydroxide.

[Claim 5] The coated glass textile according to claim 1 to 4 characterized by polyolefine system resin containing denaturation polyolefine system resin.

[Claim 6] The coated glass textile according to claim 1 to 5 characterized by processing the glass textile by the primer agent.

[Claim 7] The coated glass textile according to claim 6 whose primer agent is polyolefine system resin.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the coated glass textile which carried out the laminating of the resin constituent containing polyolefine system resin and a flame-proofing fire retardancy compound to the glass fiber textile and which has flame-proofing fire retardancy.

[0002]

[Description of the Prior Art] Conventionally, generally the sheet with which the flameproof sheet used for the welding spark and the slag receptacle, or the roll blind carried out the laminating of the polyvinyl chloride film to the woven and knitted fabrics which used the filament yarn of a glass fiber is used. Flame-resistance is given by the polyvinyl chloride layer, the strength of the upper woven and knitted fabrics comes out enough, and this sheet has the advantage that flexibility is in a certain top. However, there are dirt and problems, such as being stinking, by a plasticizer carrying out bleeding in this sheet. Moreover, while an environmental problem aggravates increasingly in recent years, if toxic gases, such as chlorine gas and hydrogen chloride gas, occur depending on combustion conditions from a vinyl-chloride-resin product and it destroys by fire below about 800 degrees C, it will become clear that dioxin occurs and relevance with "environmental hormone" will also have come to be regarded further as questionable.

[0003] It is very expensive although the sheet which carried out the laminating of the silicon resin to woven and knitted fabrics also exists from the former instead of the flame-proofing sheet which carried out the laminating of the polyvinyl chloride film. Moreover, in order to improve the welding-proof spark and the slag receptacle nature of the above-mentioned flame-proofing sheet, the sheet which used fire resistance-ized fiber also exists, but when a spark etc. flies to this sheet or this sheet burns, cyanogen gas occurs and there is a problem of being harmful to the body and an environment.

[0004]

[Problem(s) to be Solved by the Invention] The purpose of this invention is excellent in flame-resistance and fire retardancy, and is to offer the body and a coated glass textile cheap environment-friendly moreover.

[0005]

[Means for Solving the Problem] although this invention persons examined using fire resistance-ized fiber, a carbon fiber, or a metal fiber etc. which was excellent in flame-resistance and fire retardancy instead of — being expensive in a toxic gas occurring about these fiber at the time of combustion \*\*\*\* — etc. — the trouble arose. [ the filament yarn of a glass fiber conventionally used for woven and knitted fabrics ] Therefore, comparatively few glass fibers of this trouble acquired the knowledge of being most suitable for the flame-proofing fire retardancy sheet.

[0006] Furthermore, this invention persons acquired the knowledge that the possibility of generating of the chlorine gas at the time of combustion and dioxin generating at the time of incineration could be abolished, when using polyolefine system resin instead of the vinyl chloride resin used conventionally, as a result of also examining the resin which carries out a laminating. Moreover, while being able to raise the flame-resistance of a product, and fire retardancy further by adding the flame-proofing fire retardancy compound which does not contain halogens, such as for example, a metal hydroxide, in this polyolefine system resin, when this sheet carried out combustion etc., the knowledge that a toxic gas hardly occurred was acquired. this invention persons completed this invention for examination in piles further.

[0007] Namely, the coated glass textile to which this invention carried out the laminating of the resin constituent containing polyolefine system resin and a flame-proofing fire retardancy compound to (1) glass textile, (2) A coated glass textile given in the above (1) whose glass textiles are plain weave glass fabrics, (3) The above (1) whose flame-proofing fire retardancy compound is a metal hydroxide, or a coated glass textile given in (2), (4) A coated glass textile given in the above (3) whose metal hydroxide is a magnesium hydroxide or an aluminum hydroxide, And a coated glass textile given in aforementioned (1) - (4) characterized by (5) polyolefine system resin containing denaturation polyolefine system resin, (6) It is related with a coated glass textile given in aforementioned (1) - (5) characterized by processing the glass textile by the primer agent, and a coated glass textile given in the above (6) whose (7) primer agent is polyolefine system resin.

[0008]

[Embodiment of the Invention] As a glass fiber used by this invention, since, as for the former, boron and the fusing agent of a fluorine system are blended, the mechanical property is excellent and it is called E glass by the relation used in the field of electric relation, and although divided roughly into a non-alkali type and a \*\* alkali type by alkali

content, electric and since chemical resistance is highly used for a chemical application, the latter is called C glass. All can be used by this invention. In addition, since alkali content is high, the ECR glass using titanium and the fusing agent of a zinc system is developed at the same time it lowers an alkali content, and C glass substitutes for C glass and is used widely. Therefore, ECR glass can also be used by this invention. Furthermore, A glass, L glass, or S glass can be used in this invention.

[0009] The glass fiber used by this invention may be only the filament which only lengthened the monofilament and arranged it, may apply a twist to this and may knit this. Moreover, an upper twist may be applied after applying a bottom twist.

[0010] As a glass textile used by this invention, textiles, knitting, a cross lamination network, a multiaxial laminating network, or a nonwoven fabric is mentioned, for example. As textiles, plain weave, satin, twill, \*\*\*\*\*, leno weave, or \*\*\*\*\* is mentioned, for example. In this invention, the glass textile of plain weave is desirable. As knitting, square knot, rib stitch \*\* or \*\*\*\*\* of pearl stitch \*\*\*\*\*, single denbigh stitch \*\*, \*\*\*\*\* of single denbigh stitch \*\*\*\*\*, or lacework is mentioned, for example. In the fiber of a web, it is the structure of the shape of chemical, physical, or a sheet pasted up, or twined and made by heat or adhesives, for example, a wet method nonwoven fabric, a dry-process nonwoven fabric, or a direct-method nonwoven fabric is mentioned without a nonwoven fabric's weaving the web which is the aggregate of fiber or knitting it. These textiles can be manufactured by the approach according to a well-known approach or well-known it.

[0011] A glass staple fiber may be used for the glass fiber textile used by this invention, using continuous glass fiber. Namely, the thing of the shape of woven and knitted fabrics, such as glass fabrics, such as plain weave woven from yarn, for example, leno weave, satin, or twill, a roving cloth woven from roving, a glass cross lamination network, or knitting; nonwoven fabric-like thing; or glass paper by continuous glass fiber mats, such as staple fiber mats, such as a chopped strand mat and a surfacing mat, or a diamond mat, and a swirl mat, etc. is mentioned. It can manufacture by that these are well-known or the approach according to it, and a common commercial item is applied expedient.

[0012] As for the glass fiber textile used by this invention, it is desirable to perform priming, in order to raise compatibility with a resin constituent. Priming is immersed in the primer agent with which carried out the amount spreading of requests of the primer agent to one side or both sides of a glass textile, or it was usually filled up into the bus, is pulled up, and is performed by squeezing out the amount of surpluses and drying. Although a well-known approach can be used as the approach of spreading, the approach of performing, for example, using well-known means, such as an applicator, a knife coating machine, a reverse roll coater, a gravure coating machine, a flow coater, a rod coating machine, or a brush, as the method of application is mentioned, for example.

[0013] Although a well-known primer agent may be used as a primer agent, polyolefine system resin is desirable. This polyolefin resin may be dispersion and may be an emulsion. As polyolefine system resin, polyethylene system resin or a polypropylene resin is mentioned. Moreover, as a primer agent, acid denaturation of these resin may be carried out according to a well-known means, and it may be ionomer-ized further. More specifically, CHEMIPEARL (Mitsui Chemicals, Inc. make), AKUA tex (product made from central \*\*\*\*\*, Inc.), or maleic-acid denaturation polypropylene resin dispersion (MGP-1650; \*\*\*\* coal chemical product incorporated company make) is mentioned. In addition, it is desirable to use a polyethylene system primer agent as a primer agent, when polyethylene system resin contains in the resin constituent which usually carries out a laminating to a glass textile in this invention, and when the polypropylene resin contains in the resin constituent, it is desirable to use a polypropylene system primer agent as a primer agent.

[0014] The deposit efficiency of a primer agent of the rate of the primer agent to a glass textile is about about 5 - 30 % of the weight preferably about about 0.5 to 60% of the weight to the weight of the glass textile after desiccation.

[0015] As polyolefin resin used by this invention, polyethylene resin, such as a low consistency, semi-gross density or high density polyethylene, ultra high molecular weight polyethylene, straight chain-like low-density-polyethylene resin, or metallocene catalyst system straight chain-like low-density-polyethylene resin, is mentioned, for example. Moreover, polyethylene copolymer resin, such as an ethylene-vinylacetate copolymer, an ethylene-acrylic-acid copolymer, an ethylene-methacrylic-acid copolymer, ionomer resin, an ethylene-methyl acrylate copolymer, an ethylene-methyl methacrylate copolymer, an ethylene-ethyl acrylate copolymer, and an ethylene-vinylalcohol copolymer, is also mentioned. Polypropylene resin, maleic-acid denaturation polypropylene resin, and Reactors TPO or TPO can also be used as polyolefin resin in this invention. Moreover, the various thermoplastic elastomer which used as the base the various thermoplastic olefins which consist of a cross-linked polyethylene and ethylene-propylene copolymer, an ethylene-propylene-diene terpolymer, a homopolymer of a propylene, and a copolymer, a butadiene, an isoprene, and styrene can be used as polyolefin resin. These may be used independently and may mix two or more sorts.

[0016] As polyolefin resin used by this invention, C8 copolymer or C6 copolymer, the ethylene-vinylacetate copolymer, an ethylene-acrylic-acid copolymer, an ethylene-methacrylic-acid copolymer, ionomer resin, an ethylene-vinylalcohol copolymer, or Reactor TPO of metallocene catalyst system straight chain-like low-density-polyethylene resin etc. is desirable especially.

[0017] These olefine resin may be made into foamed plastics using volatile foaming agents, such as a resolvability foaming agent or a petroleum solvent, according to the resin used by request by well-known approaches, such as a low-ratio-expansion-molding method or a high-expansion-ratio-foaming method, and may give heat insulation function, impact absorption function, lightweight function, noise insulation / absorption-of-sound function, an elastic

function, or an ornament function.

[0018] The above-mentioned polyolefine system resin is made to contain a flame-proofing fire retardancy compound in this invention. As a flame-proofing fire retardancy compound, what does not contain a halogen atom is desirable. It is because a toxic gas does not occur when combustion etc. is carried out. Especially, a metal hydroxide and a water inorganic crystal compound are desirable. As such a compound, an aluminum hydroxide, a magnesium hydroxide, a calcium hydroxide, basic magnesium carbonate, hydro talc \*\*\*\*, 2 hydration gypsum, or an ulmin calcium oxide can be mentioned. Hydro talc \*\*\*\* is a water carbonate mineral, for example, a hydro talc stone, a stichtite, or a pie ROO light is mentioned.

[0019] Although these compounds have a difference in decomposition temperature and the amount of endoergic a little according to the class, they are completely common in that decompose at the time of heating at high temperature, and an endoergic operation shows the flameproofing effectiveness. Therefore, although any of the compound fundamentally described above may be used, if economical efficiency, such as an acquisition price, is also taken into consideration, a magnesium hydroxide or an aluminum hydroxide is the optimal. These may be used independently and may mix two or more sorts. Although the particle diameter of a flame-proofing fire retardancy compound is so good that it is fine, about about 0.001-10 micrometers is desirable.

[0020] Moreover, mineral matter may be made to contain further as a flame-proofing fire retardancy compound. As mineral matter, you may specifically be a detailed powdered mica, the shape of a detailed scale, needlelike or synthetic mica desirable [ a fibrous (whisker) mica ] and detailed, a mica, graphite, mica-like graphite, mica-like glass, a titanium compound, arsenide, talc, coal, or gypsum. An about about 1-25-micrometer thing is suitable for particle size.

[0021] As such a mica, for example, micro mica MK[ by CO-OP CHEMICAL CO., LTD. ]-100 grade is mentioned. As a titanium compound, for example, Sumitomo Chemical, Inc. 50LTUN(s), SS-3N, etc. are illustrated [ as a whisker-like titanium potassium (for example, TISUMO by Otsuka chemistry incorporated company (trademark)), and a boron compound ], for example as FUREKA REF-015A by Nippon Sheet Glass Co., Ltd., and mica-like graphite as boric-acid aluminum (for example, Shikoku formation incorporated company Alvo.REXX (trademark)) and mica-like glass.

[0022] the loadings of a flame-proofing fire retardancy compound — the resin constituent 100 weight section — receiving — about 30 to 80 weight section extent — it is about 50 to 70 weight section extent more preferably.

[0023] The above-mentioned polyolefine system resin may contain denaturation polyolefine system resin by request, in order to raise compatibility with a flame-proofing fire retardancy compound. As denaturation polyolefine system resin, the polypropylene resin denatured, for example by a maleic acid, an acrylic acid (meta), a fumaric acid, a tetrahydrophthalic acid, the itaconic acid, the crotonic acid, isocrotonic acid, a citraconic acid, etc., the polyethylene which carried out ionomer denaturation are mentioned. Maleic-acid denaturation polyolefin resin is desirable also in the polyolefine system resin which carried out acid denaturation especially. As for denaturation polyolefine system resin, it is desirable to carry out about 0.1 to 20 weight section extent mixing to the polyolefine system resin which is not denatured.

[0024] On the other hand, the finishing agent which raises compatibility with polyolefine system resin, for example, oleic acid, a lauric acid, a myristic acid, a palmitic acid, behenic acid, stearin acid, isostearic acid, and various fatty acids like dimer acid can be added also to a flame-proofing fire retardancy compound. Especially, oleic acid or stearin acid is desirable.

[0025] Additives usually used, such as an antioxidant, light stabilizer, a pigment, an inorganic bulking agent, an ultraviolet ray absorbent, an antistatic agent, lubricant, a dispersant, a cross linking agent, a foaming agent, or a nucleating additive, may be further blended with a resin constituent by request. As an antioxidant, the antioxidant of a phenol system or an amine system etc. is mentioned, for example. As light stabilizer, a hindered amine light stabiliser etc. is mentioned, for example. As a pigment, organic pigments, such as inorganic pigments, such as titanium oxide, ferrous oxide, or carbon black, or a copper phthalocyanine blue, etc. are mentioned, for example. As an inorganic bulking agent, a calcium carbonate, a silica, talc, a barium sulfate, clay, a mica, or silica sand is mentioned. As an ultraviolet ray absorbent, a benzophenone system, a benzotriazol system, a salicylate series, or an acrylonitrile system ultraviolet ray absorbent is mentioned, for example. As an antistatic agent, an anion system, a cation system, or a non-ion system surfactant is mentioned, for example. As lubricant, a hydrocarbon system, a fatty-acid system, a fatty-acid amide system, an ester system, an alcoholic system, or metallic soap system lubricant is mentioned, for example. As a foaming agent, inorganic system foaming agents, such as volatile foaming agents, such as a pentane or a hexane, or sodium bicarbonate, an azo system, the organic system foaming agent of nitroso \*\*, etc. are mentioned, for example.

[0026] By the above-mentioned flame-proofing fire retardancy compound and request, to the above-mentioned polyolefine system resin, well-known devices, such as a Henschel mixer, are used for the resin constituent in this invention, it mixes the above-mentioned additive, and is manufactured to it.

[0027] In this invention, the laminating of the above-mentioned resin constituent is carried out to both sides or one side of the above-mentioned glass textile. As an approach of carrying out a laminating, although the approach according to it may be used, it is desirable well-known or to carry out a laminating by the melting extrusion process or the calender method. Moreover, a laminating may be carried out by applying to this glass textile by the well-known approach, or squeezing out a part for the back surplus this resin constituent was made immersed to it, and drying it. The thickness of a resin constituent has about 10 micrometers — about 3 desirablenmm. The joining reinforcement in post processing becomes inadequate in less than about 10 micrometers, and flexibility will be spoiled if it exceeds about 3mm.

[0028] Well-known processing may be performed to the layered product formed as mentioned above. For example, the above-mentioned layered product is judged in a predetermined dimension, a high frequency welder performs junction, clinch processing of a periphery, etc., and processing of placing an eyelet subsequently is mentioned. Thus, as for the obtained coated glass textile, what has the engine performance which passes the fire-resistant specification which specifies to JISA1323 "the fire-resistant sex test to welding and the fusing spark of the sheet for construction work" is desirable.

[0029] Although the coated glass textile concerning this invention can be used for any applications if it is an application which needs fire retardancy or flame-resistance. For example, a welding spark and a slag receptacle, tentorium, a roll blind, a vertical blind, It is used suitable for the application of the underlay of the candle and incense stick for Buddhist altars, an urgent carrying-out bag and a valuables bag, fire prevention clothes and furnace previous work business clothes, a flexible duct, heat insulation bedding covering lagging, a curtain, fire prevention and a protection-from-smoke shutter, a screen, dangerous-substance covering, or cable covering.

[0030]

[Example] Plain weave glass fabrics H330 F6 112L (the Unitika glass fiber incorporated company make) was immersed in maleic-acid denaturation polypropylene resin dispersion (MGP-1650; \*\*\*\* coal chemical product incorporated company make), a part for a surplus was bound, and 150-degree C warm air was addressing[ to for 3 minutes ]-dried with the dryer. At this time, the solid content concentration of resin was 30 % of the weight. Moreover, the deposit efficiency of a primer agent was 9 % of the weight.

[0031] It mixed with the Henschel mixer and the laminating of the reactor TPO(KYATAROI KS-359P; Montel S dee KESAN Rise Corp. make) 30 weight section, the maleic-acid denaturation polypropylene resin 3 weight section, and the magnesium-hydroxide (Kuisma 5A; consonance chemistry incorporated company make) 67 weight section was carried out to the thickness of 200 micrometers with the melting extrusion process at one side of the above-mentioned plain weave glass fabrics.

[0032] When the fire-resistant sex test specified to JISA1323 "the fire-resistant sex test to welding and the fusing spark of the sheet for construction work" about the coated glass textile manufactured as mentioned above was performed, it was B sort success.

[0033]

[Effect of the Invention] The coated glass textile concerning this invention is \*\*\*\* about the effectiveness that the coated glass textile suitable since it excels in flame-resistance and fire retardancy for the application as which flame-resistance or fire retardancy is required can be offered. Since the coated glass textile concerning this invention can be manufactured cheaply, it is advantageous on industry. Moreover, since a toxic gas is hardly generated even if a spark flies or the coated glass textile concerning this invention burns, this invention can offer the body and an environment-friendly product.

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[Translation done.]